PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
LEE, Won-Hee

8th Fl.Sung-ji Heights, II 642-16 Yoksam-dong Kangnam-ku
Seoul 135-080 Republic of Korea

PCT

WRITTEN OPINION OF THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

(PCT Rule 66)

Date of mailing *(day/month/year)*	16 DECEMBER 2005 (16.12.2005)
Applicant's or agent's file reference: 4FPO-11-04	REPLY DUE within 1 months from the above date of mailing

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/KR2004/003435	24 DECEMBER 2004 (24.12.2004)	27 DECEMBER 2003 (27.12.2003)

International Patent Classification (IPC) or both national classification and IPC
IPC7 C07D 307/68

Applicant
KOREA RESEARCH INSTITUTE OF CHEMICAL TECHNOLOGY et al

1. ☒ The written opinion established by the International Searching Authority :
   ☒ is ☐ is not
   considered to be a written opinion of the International Preliminary Examining Authority.
2. This _____ (first, etc.) opinion contains indications relating to the following items:
   - ☒ Box No. I Basis of the opinion
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.
   When ? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(e).
   How ? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.
   Also For the examiner's obligation to consider amendments and/or arguments, seeRule 66.4bis. For an informal communication with the examiner, see Rule 66.6. For an additional opportunity to submit amendments, see Rule 66.4.
   If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary report on patentability (Chapter II of the PCT) must established according to Rule 69.2 is: 17 APRIL 2006 (17.04.2006)

Name and mailing address of the IPEA/KR	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea	LIM, Hea Joon
Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-5600

Form PCT/IPEA/408 (cover sheet) (April 2005)

WRITTEN OPINION OF THE
INTERNATIONAL PRELIMINARY EXAMING AUTHORITY

International application No.
PCT/KR2004/003435

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which was filed, unless otherwise indicated under this item.

☐ This opinion is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))
☐ publication of the international application (under Rule 12.4)
☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this opinion has been established on the basis of (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."):

☒ the international application as originally filed

☐ the description:
pages _____, as originally filed/furnished
pages _____ received by this Authority on _____
pages _____ received by this Authority on _____

☐ the claims:
pages _____, as originally filed/furnished
pages _____, as amended (together with any statment) under Article 19
pages _____ received by this Authority on _____
pages _____ received by this Authority on _____

☐ the drawings:
pages _____, as originally filed/furnished
pages _____ received by this Authority on _____
pages _____ received by this Authority on _____

☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings,sheet/fig _____
☐ the sequence listing (specify): _____
☐ any table(s) related to the sequence listing (specify): _____

4. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Suplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings,sheet/fig _____
☐ the sequence listing (specify): _____
☐ any table(s) related to the sequence listing (specify): _____

WRITTEN OPINION OF THE
INTERNATIONAL PRELIMINARY EXAMING AUTHORITY

International application No.
PCT/KR2004/003435

Box No. V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-10
	Claims	
Inventive step (IS)	Claims	1-10
	Claims	
Industrial applicability (IA)	Claims	1-10
	Claims	

2. Citations and explanations :

Reference is made to the following documents:
D1 = US 5627193 A (06. 05. 1997)
D2 = US 6630506 B1 (07. 10. 2003)
D3 = WO 03-101450 A1 (11. 12. 2003)
D4 = WO 99-33460 (08. 07. 1999)

The present invention relates to furancarbonylguanidine derivatives which can be used as a NHE-1 inhibitor, a preparation method thereof and a pharmaceutical composition comprising the same.

D1 discloses quinoline-4-carbonylguanidine derivative and a preparation method therof and a NHE inhibitor containing the same. D2 discloses acyl guanidines which are used as NHE inhibitors. D3 discloses N-((3-oxo 2,3-dihydro-1H-isoindol-1-yl)acetyl)guanidine derivatives as NHE-1 inhibitors for the treatment of infarction and angina pectoris. D4 discloses acyl guanidine sodium/proton exchange inhibitors and method.

1. Novelty
None of the prior art disclose the compound of formula(I) claimed in the present invention and their property. Therefore, the present invention seems to be novel(PCT Article 33(2)).

2. Inventive Step
Although D1-D5 disclose the compounds showing a similar pharmaceutical activity as the compounds of the present invention, neither structural variation nor combination of different structural features of compounds disclosed therein lead to the structural properties as those described in the present invention. Thus the present invention is regarded as being inventive according to PCT Article 33(3).

3. Industrial Applicability
The present invention meets the criteria set out in PCT Article 33(4).